



POWER SOLUTIONS

DELL.COM/PowerSolutions

COVER STORY

8 REDUCING STORAGE COMPLEXITY

By Eric Endebrock; Dave Jaffe, Ph.D.; and Kathryn White

Digital data is outstripping storage capacity and complex systems are failing to adapt under the strain as storage demands grow faster than IT budgets. The good news is that easy-to-use IP-based networked storage with built-in data protection and management capabilities promises to bridge the budget gap—and effectively complement traditional Fibre Channel-based storage area networks.



22 FIRST LOOK

STORAGE CONSOLIDATION WITH THE DELL POWERVAULT MD3000i iSCSI ARRAY

By Dave Jaffe, Ph.D., and Kendra Matthews

The Dell PowerVault MD3000i Internet SCSI (iSCSI) array enables enterprises to easily consolidate storage for multiple servers. Dell engineers performed tests demonstrating that the PowerVault MD3000i provides sufficient throughput in a consolidated environment.



SIMPLIFY YOUR IT • page 54

THE DELL PATH TO INNOVATION AND GROWTH

By Joe Pollock

Enterprises of all sizes struggle with the ever-increasing complexity of IT. By helping simplify and streamline the requirements for ongoing operations and systems maintenance, the Dell IT simplification approach enables organizations to reclaim the time, money, and personnel needed to turn innovation into a daily business practice instead of a long-term business goal. For more information, visit DELL.COM/Simplify.

NOW PLAYING: DELL DATACENTER OF THE FUTURE PODCAST SERIES



Flexible computing may conjure up a confusing array of terms: thin clients, virtual clients, and bladed desktops, for example. However, it is not one technology but a holistic strategy—controlling data while providing flexible data access. “Flexible Computing: What Is It and How Will It Simplify IT?” explains flexible computing initiatives from Dell. For more information, visit DELL.COM/Podcast.

EDITOR'S COMMENTS

6 In Search of IP Storage

By Tom Kolnowski

FEATURE SECTION: NEW HORIZONS IN ENTERPRISE STORAGE

16 iSCSI: Changing the Economics of Storage Part 3—Using iSCSI in Small and Medium Businesses

By Travis Vigil

iSCSI-based storage arrays such as the Dell PowerVault MD3000i offer a cost-effective way for small and medium businesses, remote offices, and departments and workgroups to consolidate storage while providing powerful, easy-to-use management tools.

28 The Advantages of IP-Based Networked Storage for Midsize Businesses

By Mike Apigian

Advances in IP-based networked storage technology such as network attached storage (NAS) and iSCSI can help organizations of all sizes take advantage of existing resources to easily and cost-effectively build, maintain, and manage sophisticated storage networks.

30 Intelligent E-mail Archiving: Classification, Filtering, Retention, and Discovery

By Art Gilliland

The Symantec intelligent archiving approach enables organizations to efficiently classify, filter, retain, and search for e-mail messages while helping simplify management and control resource costs.

34 Enterprise Workloads for Small and Medium Businesses on the Dell PowerVault NX1950

By Dave Jaffe, Ph.D., and Todd Muirhead

The Dell PowerVault NX1950 integrated NAS system offers cost-effective, versatile storage for small and medium businesses and remote offices.

38 Configuring Microsoft SQL Server 2005 on Dell Servers and Storage

By Wendy Chen, Sumner Stewart, Paul Rubin, Chethan Kumar, and Alvin Peng

Following best practices from Dell and Microsoft can help enterprises design a high-performance Microsoft SQL Server 2005 database on Dell PowerEdge servers and Dell PowerVault storage.

42 Exploring iSCSI and iSCSI Boot for SAN Implementations

By Robert Lusinsky and David Christensen

Broadcom and Dell have teamed up to offer enhanced iSCSI boot—which can provide increased system reliability, simplified management, and accelerated restore processes—on Broadcom Ethernet controllers in Dell PowerEdge servers.

SEE IT HERE FIRST ►



NEW HORIZONS IN ENTERPRISE STORAGE

Oracle Data Guard Deployment Using Dell/EMC CX3 Storage Replication

By Wendy Chen, Ujjwal Rajbhandari, and Kai Yu

Using Dell/EMC CX3 storage replication software when deploying Oracle Data Guard can help significantly reduce primary database downtime during the deployment process.

Parallel Rendering Technologies for HPC Clusters

By Li Ou, Ph.D.; Yung-Chin Fang;
Onur Celebioglu; and Victor Mashayekhi, Ph.D.

Using parallel rendering technologies with clusters of high-performance computing (HPC) workstations configured with high-end graphics processors helps scale out graphics capabilities.

Utilizing Open MPI Middleware for HPC Clusters

By Toby Sebastian, Sanjay Lalwani,
and Munira Hussain

Open MPI helps simplify the porting and execution of Message Passing Interface (MPI)-based applications and supports many HPC platforms, interconnects, and environments.

Migrating Remote Installation Services to Windows Deployment Services in Microsoft Windows Server 2003

By Sankari N., Manjunath Narayanan, and Gobinath K.

Microsoft Windows Deployment Services can be used for deploying the Windows Vista OS as well as the forthcoming Windows Server 2008 OS and a variety of legacy operating systems.

Using IPMITool Raw Commands for Remote Management of Dell PowerEdge Servers

By Seshadri N. and Raghavendra Babu

To help maximize the capabilities of the baseboard management controllers in Dell PowerEdge servers, administrators can access hardware functions using IPMITool raw commands.

Xen Virtualization in Red Hat Enterprise Linux 5

By Jose De la Rosa and Puneet Dhawan

The open source Xen virtualization hypervisor included in Red Hat Enterprise Linux 5 provides key components to help build dynamic, scalable virtualized environments.

Maintaining Dell Platforms with Dell Technical Updates

Firmware updates for Dell PowerEdge components and Dell PowerVault storage can help improve system functionality and minimize potential problems.



YOUR INFORMATION, YOUR WAY

The Dell Power Solutions articles on this page are available exclusively online at DELL.COM/PowerSolutions. Plus: Check the Dell Power Solutions Web site for our early-release articles, how-to's, implementation studies, and expert tips you won't find anywhere else.

Need specific subject matter at your fingertips? Search our **Related Categories** index and then visit full-text articles from current and back issues online. Can't wait? For real-time access to content as soon as it's posted, subscribe your favorite RSS (really simple syndication) reader to the feed at the Dell Power Solutions Web site or DELL.COM/RSS.

Reprinted from Dell Power Solutions, November 2007. Copyright © 2007 Dell Inc. All rights reserved.

46 **Optimized Dell PowerVault Storage for Microsoft Exchange Server 2007**

By Suman Kumar Singh and Mahmoud Ahmadian
Dell-recommended solutions for Microsoft Exchange environments—including Dell PowerVault MD1000 and PowerVault MD3000 storage—can help simplify the design and deployment of messaging infrastructures.

50 **Enterprise-Class SAN Solutions for Small and Medium Businesses**

By Bala Nagesh
Dell and Cisco have collaborated to create storage area network (SAN) solutions designed specifically for small and medium businesses, allowing them to deploy high-performance, enterprise-class storage in a cost-effective, easy-to-manage way.

DEPARTMENTS

DELL ENTERPRISE TECHNOLOGY CENTER SERIES

58 **Virtualizing Microsoft Exchange Server 2007 with VMware ESX Server 3**

By Todd Muirhead and Kong Yang

62 **Reducing Power Costs by Migrating Legacy Servers to a Virtualized Dell PowerEdge 2950**

By Scott Hanson

IMPLEMENTATION STUDY

66 **Dell IT Implements Factory Automation and Visibility in Real Time**

By Peter Swartz, Clay Johnson, and Richard Brown

ENTERPRISE RESOURCE PLANNING: SAP

70 **Driving Business Process Innovation with Service-Oriented Architecture and SAP NetWeaver**

By Michael Bechtauf

INDUSTRY SOLUTIONS

74 **Package Deal: Helping to Reduce IT Complexity with Dedicated Appliances**

By Jaleel Mohammed and David Pennington

78 **High-Stakes Technology: How Dell Platforms Keep Casino Video Games Flush**

By Patty Young, Franklin Flint, and David Havener

SPECIAL SECTION: OPTIMIZING VIRTUALIZATION PERFORMANCE

82 **Building a Fast, Flexible Platform for Virtualization with AMD Opteron Processor-Based Dell PowerEdge Servers**

SECURITY

84 **Symantec Endpoint Protection: A Unified, Proactive Approach to Enterprise Security**

By Lauren Duda

PRODUCT SHOWCASE: ATI FIREGL GRAPHICS ACCELERATORS FROM AMD

88 **Maximizing Productivity with ATI FireGL Workstation Graphics Accelerators**

DELL INFRASTRUCTURE CONSULTING SERVICES · page 52

PROTECTING VITAL BUSINESS INTERESTS WITH A SIMPLIFIED STORAGE SOLUTION

A flood tide of digital data and increasingly complex regulatory requirements have made data backup, recovery, and archiving critical aspects of enterprise operations. Dell Services experts can assess how effectively an information infrastructure is getting the job done and deploy integrated, best-of-breed storage solutions to help ensure the safety and recoverability of critical data.



TALK BACK

We welcome your questions, comments, and suggestions. Please send your feedback to the *Dell Power Solutions* editorial team at us_power_solutions@DELL.COM.

APPLICATION DELIVERY SOLUTIONS

- 90 **Addressing Web-Based Application Performance and Availability with Citrix NetScaler**

By John Gudmundson

SYSTEMS MANAGEMENT

- 93 **Flexible Management Tools for Dell Remote Console Switches**

By Max A. Benham and William Muscato

HIGH-PERFORMANCE COMPUTING

- 97 **Configuring InfiniBand on HPC Clusters Using the OpenFabrics Enterprise Distribution**

By Munira Hussain, Arun Rajan, Sreeram Vedantham, and Jacob Liberman

- 102 **Multi-core Scalability with FLUENT and Microsoft Windows Compute Cluster Server 2003**

By Aziz Gulbeden and Amina Saify

- 105 **Evaluating the Myrinet-10G Interconnect on Dell PowerEdge Servers**

By Sreeram Vedantham, Shivaraj Nidoni, and Munira Hussain

- 109 **Intel Cluster Ready and Platform Open Cluster Stack: Clusters Made Simple**

SPECIAL SECTION: PARALLEL APPLICATION DEVELOPMENT SOLUTIONS

- 112 **Extending OpenMP to Clusters**

ADVERTISER INDEX

Advanced Micro Devices, Inc.	65, 81
Avocent Corporation	95
Dell Inc.	14-15, C3
EMC Corporation	7
Enterasys Networks, Inc.	27
Intel Corporation	C2, 21
Oracle Corporation	C4
SAP AG	73
Symantec Corporation	32a



EDITORIAL STAFF

Editor-in-Chief and Publisher • Tom Kolnowski

Managing Editor • Deb McDonald

Features Editor • Kathryn White

Associate Managing Editor • Liza Graffeo

Senior Editor • Jim Duncan

Editorial Assistant • Amy J. Parker

Art Director and Cover Designer • David Chan

Designer and Illustrator • Cynthia Webb

Contributing Writers • Mahmoud Ahmadian; Mike Apigian; Raghavendra Babu; Michael Bechauf; Max A. Benham; Richard Brown; Onur Celebioglu; Wendy Chen; David Christensen; Jose De la Rosa; Puneet Dhawan; Lauren Duda; Eric Endebeck; Yung-Chin Fang; Franklin Flint; Art Gilliland; John Gudmundson; Aziz Gulbeden; Scott Hanson; David Havener; Munira Hussain; Dave Jaffe, Ph.D.; Clay Johnson; Gobinath K.; Chethan Kumar; Sanjay Lalwani; Jacob Liberman; Robert Lusinsky; Victor Mashayekhi, Ph.D.; Kendra Matthews; Jaleel Mohammed; Todd Muirhead; William Muscato; Sankari N.; Seshadri N.; Bala Nagesh; Manjunath Narayanan; Shivaraj Nidoni; Li Ou, Ph.D.; Alvin Peng; David Pennington; Joe Pollock; Arun Rajan; Ujjwal Rajbhandari; Paul Rubin; Amina Saify; Toby Sebastian; Suman Kumar Singh; Sumner Stewart; Peter Swartz; Sreeram Vedantham; Travis Vigil; Kathryn White; Kong Yang; Patty Young; and Kai Yu

Contributing Photographers • Tony Bolding, Bryan Kuntz, Adran Matte, and Joey Pena

Online Design • Joi Chevalier

Special Inserts Manager • Kristin Kreisel

SUBSCRIPTIONS

Subscriptions are complimentary to qualified readers who complete the online subscription form. To sign up as a new subscriber, renew an existing subscription, change your address, or cancel your subscription, access the online Subscription Center forms at DELL.COM/PowerSolutions. For other subscription services, please e-mail us_power_solutions@DELL.COM.

ABOUT DELL

Dell Inc., headquartered in Round Rock, Texas, near Austin, listens to its customers and delivers innovative technology and services they trust and value. Uniquely enabled by its direct business model, Dell is a leading global systems and services company and No. 34 on the Fortune 500 list. For more information, visit our Web site at DELL.COM.

Dell cannot be responsible for errors in typography or photography. Dell, the Dell logo, Dell OpenManage, Dell Precision, PowerConnect, PowerEdge, PowerVault, and UltraSharp are trademarks of Dell Inc. Other trademarks and trade names may be used in this publication to refer to either the entities claiming the marks and names or their products. Dell disclaims any proprietary interest in the marks and names of others.

Dell Power Solutions is published in February, May, August, and November by Dell Inc., *Dell Power Solutions*, One Dell Way, Mail Stop RR5-03, Round Rock, TX 78682, U.S.A. No part of this publication may be reprinted or otherwise reproduced without permission from the editor-in-chief. Dell does not provide any warranty as to the accuracy of any information provided through *Dell Power Solutions*. Opinions expressed in this magazine may not be those of Dell. The information in this publication is subject to change without notice. Any reliance by the end user on the information contained herein is at the end user's risk. Dell will not be liable for information in any way, including but not limited to its accuracy or completeness. Dell does not accept responsibility for the advertising content of the magazine or for any claims, actions, or losses arising therefrom. Goods, services, and/or advertisements within this publication other than those of Dell are not endorsed by or in any way connected with Dell Inc.

Copyright © 2007 Dell Inc. All rights reserved. Printed in the U.S.A.

Printed on recycled paper containing 10 percent post-consumer waste.

November 2007

STOCK NUMBER: DPS 2007-11 (NOVEMBER 07)